COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, SS

SUPERIOR COURT
DOCKET NO. 1572

COMMONWEALTH
v.
KEVEN SEME
Defendant

MOTION TO EXCLUDE EXPERT TESTIMONY ON FRICTION RIDGE ANALYSIS, OR, IN THE ALTERNATIVE, TO CURTAIL SUCH TESTIMONY, UNDER DAUBERT V. MERRELL DOW PHARMACEUTICALS[1]

Keven Seme, by counsel, respectfully moves this Court to exclude expert testimony on the subject of friction ridge analysis, or, in the alternative, to limit such testimony. Friction ridge analysis used for the purpose of conclusively identifying a particular individual has been discredited by the scientific community, as laid out in a recent report by the National Academy of Sciences[2] ("NAS Report"). As described below, friction ridge analysis does not satisfy the standards for the admissibility of scientific evidence laid out in *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 589 (1993) because its conclusions are not quantifiable or testable, the methodology has not been the subject of publication in peer-reviewed scientific journals, the methodology's rate of error is unknown and unknowable, there are no uniform standards or criteria for reaching conclusions, and friction ridge analysis has been rejected by the scientific community. In addition, given this forensic method's significant shortcomings and thoroughly subjective nature, having an expert testify as to the conclusions of a fingerprint analysis would greatly confuse the jury and would be far more prejudicial than probative.

I. STATEMENT OF FACTS

The Commonwealth intends to offer in evidence a latent fingerprint(s) of the defendant, Mr. Keven Seme. According to police reports two fingerprints of Mr. Seme were located on 1 frame of the firearm adjacent to the left side trigger and 2 on the top of the firearm casing. The firearm was discovered by police shortly after the shooting, discarded in a driveway near the scene of the shooting of the victim in this case, Mr David Colon. (See report, authored by State Police Sgt. William Turbokas, attached.)

II. LEGAL STANDARD

A trial court judge plays a "gatekeeping" role when it comes to expert testimony, *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993) (*Daubert*), and *Commonwealth v. Lanigan*, 419 Mass. 15, 641 N.E.2d 1342 (1994) (*Lanigan*).

There are five factors for the Court to consider admissibility of expert testimony:

In *Lanigan, supra* at 25–26, 641 N.E.2d 1342, we adopted, in part, the new *Daubert* standard, which set forth five factors that a judge should consider in determining the reliability of proposed scientific evidence. The five factors are whether the scientific theory or process (1) has been generally accepted in the relevant scientific community; (2) has been, or can be, subjected to testing; (3) has been subjected to peer review and publication; (4) has an unacceptably high known or potential rate of error;

[1] This Motion is taken in large part from that filed in *USA v. Omar STEELE*, No. 8:12-cr-00014-RWT.

[2] Strengthening Forensic Science in the United States: A Path Forward Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf

and (5) is **596 governed by recognized standards. *Daubert*, *supra* at 593–594, 113 S.Ct. 2786. *See Commonwealth v. Patterson*, *supra* at 635–636, 840 N.E.2d 12.

Com. v. Powell, 450 Mass. 229, 238 (2007)

III. ARGUMENT

A. The Scientific Community Has Rejected Friction Ridge Analysis as a Method of Conclusively Identifying a Particular Individual.

The scientific community has called into the question the acceptance of friction ridge analysis as a method of conclusively establishing that a particular fingerprint was left by a particular individual. A recent and thorough review of the scientific literature on friction ridge analysis by the prestigious National Academy of Sciences concluded that, for a variety of reasons, friction ridge analysis cannot uniquely identify a specific individual with scientific certainty. See NAS Report. The sections that follow provide an overview of friction ridge analysis and the National Academy of Sciences' evaluation of this forensic method.

1. Overview of Friction Ridge Analysis

a. Friction Ridges

The surfaces of the hands and feet are covered with tiny ridge-like structures that can leave a reproduction of themselves—such as a fingerprint—by transferring natural oils or other substances onto an object, or by coming into contact with substances like paint or blood in which they leave an impression. The ridge-like structures on the hands and feet are called friction ridges because they create friction for gripping, and the study of the images that friction ridges leave on objects is called friction ridge analysis. Office of the Inspector General, U.S. Dep't of Justice, *A Review of the FBI's Handling of the Brandon Mayfield Case* 98 (2006) (hereinafter "*Mayfield Report*"), *available at* http://www.justice.gov/oig/special/s0601/PDF_list.htm (citing David R. Ashbaugh, *Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology* at Ch. 3 (1999)).

There are three levels of detail in friction ridge patterns. Level 1 encompasses the general pattern of the ridges.

Level 2 details are features of individual ridges, such as when ridges come to an end or fork into two ridges.

Level 3 details are the very smallest details considered in friction ridge analysis and include the shape of ridge edges, pores in ridges, and the width of ridges. *Id.* at 99.

The basic assumptions of friction ridge analysis are (1) permanence, meaning that the details of a person's fingerprint are more or less permanent, and (2) uniqueness, meaning that each person's friction ridges form a unique pattern not shared by anyone else. *Id.*

b. Factors Affecting the Quality of Fingerprints

Fingerprints taken by police officers from suspects or others associated with an investigation, often referred to as "known prints," are usually taken under ideal, controlled circumstances, either electronically or with ink, capturing an extremely high level of detail. *Id.* at 104. Fingerprints collected from evidence or crime scenes, on the other hand, referred to as "latent prints," are almost never left under ideal or controlled circumstances and thus are almost always of much lower quality than known prints. *Id.*

Latent prints can be distorted in many ways. A flexible surface like a plastic bag may yield a latent print of less quality than a rigid surface like glass, a fingerprint left in drying paint may yield greater detail than one left by the skin's own oils, and the way a finger is moving when it touches a surface—with direct downward pressure or with sideways pressure—will affect

whether the fingerprint is smeared and whether ridges appear bent or stretched in the latent print. *Id.* at 103. Finally, different ways of "lifting" latent prints can affect how details of the print are reproduced. *Id.* at 103-04.

The crucial point is that any distortions in a latent print can give rise to two problems. First, the latent print may exhibit Level 2 or Level 3 details that do not actually exist in the friction ridges that left the fingerprint, such as a blot that makes it appear as if two ridges meet when they actually do not. Second, the latent print may not exhibit all of the Level 2 and Level 3 details that exist in the actual friction ridges. For example, what appears in a latent print to be a ridge ending may actually be a continuing ridge that was not reproduced in its entirety.

Either problem can be crucially misleading because Level 2 and Level 3 details are what fingerprint examiners rely on to make an identification. As stated in a document titled "Standards for Conclusions," published by the Scientific Working Group on Friction Ridge Analysis, Study and Technology (hereinafter "SWGFAST"), "The presence of one discrepancy is sufficient to exclude" a potential suspect, but "[d]istortion is not a discrepancy and is not a basis for exclusion." SWGFAST, *Standards for Conclusions, available at* www.swgfast.org. The examiner's task, then, is to "distinguish those features on a latent print that reflect true events in the friction skin from those features that result from the imperfect conditions under which latent prints are often made or developed." *Mayfield Report* at 106.

c. The Process of Friction Ridge Analysis

The fingerprint process used in this case is one commonly used: ACE-V, which stands for Analysis, Comparison, Evaluation, and Verification. *NAS Report* at 137. In the analysis stage, the examiner reviews the latent and known prints for the details described above, taking into account a number of variables:

(1) Condition of the skin
(2) Type of residue

(3) Mechanics of touch
(4) Nature of the surface touched
(5) Development technique
(6) Capture technique
(7) Size of the latent print or the percentage of the surface that is available for comparison.

Id. at 137-38. If the latent or known prints do not have sufficient detail for identification or exclusion, then the examiner need not take on the remainder of the process and reaches a conclusion of "Inconclusive." *Id.* at 138; SWGFAST, *Standards for Conclusions.*

In the second step, Comparison, the examiner visually compares corresponding details of the known and latent print. The details compared are those described above, as well as ridge counts, the length of ridges, the thickness of ridges and the gaps between them, crease patterns, scars, and temporary features. *NAS Report* at 138.

In the third step, Evaluation, the examiner decides whether there is sufficient agreement in the details of the latent and known prints to establish an identification, defined by SWGFAST as "agreement of sufficient friction ridge details in sequence." SWGFAST, *Standards for Conclusions.* How much detail agreement is "sufficient" to support an identification is based on the experience of the examiner, *NAS Report* at 138, and cannot be reduced to a simple formula or a quota of agreeing details. Two prints may have a dozen points of correspondence, but, as noted above, only one discrepancy is sufficient to defeat an identification. "There is no scientific basis for requiring that a predetermined number of corresponding friction ridge details be present in two impressions in order to effect individualization." SWGFAST, *Standards for Conclusions.*

In the final step, Verification, a second examiner repeats the other steps of the process to see whether she arrives at the same conclusion, though the second examiner may know the conclusion reached by the first examiner in advance. *NAS Report* at 138

2. Evaluation of Friction Ridge Analysis by the National Academy of Sciences

On November 22, 2005, the Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006 became law. 119 Stat. 2290 (2005). Through this act, Congress directed the United States Attorney General to provide funding to the

National Academy of Sciences ("NAS") to convene a committee, known at the Committee on Identifying the Needs of the Forensic Science Community, to study the current state and remaining needs of the forensic sciences. *NAS Report* at 2. This Committee was formed under the auspices of the NAS's Committee on Science, Technology, and Law and the Committee on Applied and Theoretical Statistics, and "was composed of many talented professionals, some expert in various areas of forensic science, others in law, and still others in different fields of science and engineering." *Id.* at xx. After three years of study, including a review of all published scientific literature related to particular forensic methods, the NAS issued a report that revealed that some forensic disciplines, including friction ridge analysis, severely lack scientific validity. *Id.* at 3. The report's central finding was that other than DNA analysis, "no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source." *Id.* at 5. Additionally, imprecise or exaggerated expert testimony has sometimes contributed to the admission of erroneous or misleading evidence. *Id.* at 3.

In its review of friction ridge analysis, the National Academy of Sciences thoroughly reviewed all of the literature relating to friction ridge analysis, heard testimony from trained examiners, and reviewed cases in which friction ridge analysis was used as evidence, and the NAS found that the method has significant shortcomings, which are outlined below.

a. Fundamental Assumptions of Friction Ridge Analysis Have Never Been Verified Scientifically.

As noted earlier, friction ridge analysis operates from the assumption that no two people have the same fingerprints. This assumption has not been established scientifically. No scientific study has ever established the frequency with which any friction ridge features—even Level 1 features like the whorl or arch pattern—occur in the human population. Moreover, because latent prints usually present only a portion of a total fingerprint, it is important to note that no scientific study has ever established the frequency with which *portions* of a fingerprint occur in the human population. In other words, it may be rare for two people to have the exact same total fingerprint, but how rare is it for part of one person's fingerprint to resemble a portion of someone else's fingerprint? Finally, even if all fingerprints are absolutely unique, no scientific study has ever established that their uniqueness can always be recognized:

Uniqueness and persistence are necessary conditions for friction ridge identification to be feasible, but those conditions do not imply that anyone can reliably discern whether or not two friction ridge impressions were made by the same person. Uniqueness does not guarantee that prints from two different people are always sufficiently different that they cannot be confused, or that two impressions made by the same finger will also be sufficiently similar to be discerned as coming from the same source. The impression left by a finger will differ every time, because of inevitable variations in pressure, which change the degree of contact between each part of the ridge structure and the impression medium. None of the variabilities—of features across a population of fingers or of repeated impressions left by the same finger—has been characterized, quantified, or compared.

Id. at 144. Because there are no studies of how often fingerprint patterns recur in the human population—either overall fingerprint patterns or portions of fingerprints—as well as no studies of whether the uniqueness of fingerprints can always be recognized, friction ridge analysts cannot answer a basic question that goes to the heart of their field's reliability: What is the likelihood that a fingerprint made by a random finger would match the known print just as closely as the latent print in this case?

b. Friction Ridge Analysis Is Subjective.

"[T]he assessment of latent prints from crime scenes is based largely on human interpretation." *Id.* at 139. Friction ridge analysis is inherently subjective, relying as it does on an examiner's visual observations and decisions about whether pairs of visual phenomena are similar or dissimilar. *Id.* The subjective nature of the comparisons makes them difficult to repeat or assess. As described below, the Verification stage of the ACE-V process does not answer the problem of the lack of repeatability because a verification is still valid even though the second examiner relies on different points of correspondence to reach a conclusion. *Id.* In addition, whether a fingerprint comparison results in an identification is a subjective assessment that is totally within the discretion of the examiner: "the criteria for identification are much harder to define, because they depend on an examiner's ability to discern patterns (possibly complex) among myriad features and on the examiner's experience judging the discriminatory value in those patterns." *Id.*

c. Friction Ridge Analysis Has No Known Error Rate.

Friction ridge analysts have claimed at times that friction ridge analysis has a zero error rate. *Id.* at 142. Such claims "are not scientifically plausible." *Id.* In fact, no reliable studies have been able to establish the error rate for friction ridge analysis, and, as currently formulated in the ACE-V paradigm, it is not even clear whether friction ridge analysis can be subjected to error rate testing. *Id.* The *NAS Report* explained the issue this way:

ACE-V provides a broadly stated framework for conducting friction ridge analyses. However, this framework is not specific enough to qualify as a validated method for this type of analysis. ACE-V does not guard against bias; is too broad to ensure repeatability and transparency; and does not guarantee that two analysts following it will obtain the same results. For these reasons, merely following the steps of ACE-V does not imply that one is proceeding in a scientific manner or producing reliable results.

Id. As the legal scholar and fingerprint expert Jennifer Mnookin has noted, "ACE-V as it exists now may be a cluster of practices, a point of view or an analytic framework. But it is not yet a testable scientific method." Jennifer L. Mnookin, *The Validity of Latent Fingerprint Identification: Confessions of a Fingerprinting Moderate*, 7 L. Probability & Risk 127, 132 (2008).

d. Friction Ridge Analysis Lacks Uniform Criteria.

As noted above, there is no set formula or criteria for what level of correspondence between two prints is sufficient for an examiner to declare that they came from the same source. Neither are there any formulas or criteria for what factors permit an examiner to say that a discrepancy between a latent print and a known print can be attributed to distortion rather than the two prints coming from different people. "[T]he ACE-V method does not specify particular measurements or a standard test protocol, and examiners must make subjective assessments throughout .... [T]he threshold for making a source identification is deliberately kept subjective[, and] the outcome of a friction ridge analysis is not necessarily repeatable from examiner to examiner." *Id.* at 139. The lack of uniformity leaves the examiner with an incredible amount of discretion and makes it difficult, if not impossible, to evaluate the examiner's conclusions.

e. Unlike Other Methods of Identification, Examiners Do Not Identify the Criteria for Their Comparisons Before Analyzing Fingerprints.

As noted in the *NAS Report*, a typical DNA profile reports how often certain base pairs repeat in 13 specific segments of DNA. Scientific studies have established mathematically the probability that a base pair will be repeated at each of the 13 segments in the human population. From this data, scientists can determine exactly how likely it is that two sets of DNA with matching DNA profiles came from the same person. *Id.*

This kind of analysis is significantly different from friction ridge analysis. A fingerprint examiner has no equivalent to the 13 pre-determined segments of DNA; any portion of a fingerprint is subject to analysis. A fingerprint examiner has no idea how frequently friction ridge details or patterns occur in the human population, and so she has no idea, aside from her own experience in looking at fingerprints, how much weight each corresponding detail should bear in the overall analysis.

[B]efore examining two fingerprints, one cannot say a priori which features should be compared .... Because a feature that was helpful during a previous comparison might not exist on these prints or might not have been captured in the latent impression, the process does not allow one to stipulate specific measurements in advance, as is done for DNA analysis .... [P]opulation statistics for fingerprints have not been developed, and friction ridge analysis relies on subjective judgments by the examiner.

Id. The inability to identify the criteria for a comparison in advance leaves substantial discretion in the hands of the examiner, makes any conclusions difficult to evaluate, and increases the likelihood of a misidentification.

f. Friction Ridge Analysis Presents Many Opportunities for Conscious Abuse and Honest Mistakes.

As noted above, one of the most critical distinctions an examiner has to make is whether a detail can be attributed to the actual friction ridge pattern or if instead it is a distortion resulting from how the fingerprint was left or collected. Considering the importance of this decision in light of the total lack of criteria for making or evaluating the examiner's decision, it is obvious that an examiner can very easily abuse her authority or make an honest mistake.

It was exactly this kind of honest mistake that led to the erroneous identification of Brandon Mayfield as the Madrid train bomber by the FBI in 2004. In that case, most of a fingerprint on a bag of detonators found at the bombing site was very similar to Mayfield's fingerprint, but the upper left portion of the latent print was entirely different. As the Department of Justice report on the case noted, "The examiners explained this difference as being the result of a separate touch, possibly by a different finger or a different person." *Mayfield Report* at 9. In other words, examiners found that the discrepancy between the latent print and the known print was attributable to distortion in the way the latent print was left on the bag. This was an honest mistake, but it led to the identification (and the detention) of an innocent person.

As the *NAS Report* noted, "A criticism of the latent print community is that the examiners can too easily explain a 'difference' as an 'acceptable distortion' in order to make an identification." *NAS Report* at 145 (citing *Mayfield Report*).

g. There is a Significant Risk of Bias in Friction Ridge Analysis.

In the eyewitness identification context, courts have recognized for many years that the so-called "show-up" identification, where a suspect is paraded before a witness and asked whether the suspect is the perpetrator, can be unduly suggestive. And yet fingerprint examiners are faced with the "show-up" problem all the time: they are asked to determine if a suspect print matches a known print, or they are asked to verify another examiner's conclusion of a match. This kind of contextual information can be tremendously biasing. Jennifer Mnookin describes one study of biasing in the fingerprint context, a study that relates to the Mayfield case described above:

[A] small handful of fingerprint examiners were each given a pair of fingerprints. The examiners were informed that they were examining the prints from the Brandon Mayfield scandal, in which a latent print found in connection with the Madrid bombing was erroneously identified by several top-notch, highly experienced fingerprint examiners as belonging to Oregon attorney and Muslim convert Brandon Mayfield. Actually, each examiner was handed not the Mayfield prints, but instead a pair of prints that each examiner had previously testified to be a certain match. Looking at the same prints that they had previously sworn, under oath, in court, to be a match (but of course not knowing that they were looking at prints they had formally identified as a match), four out of the five examiners changed their minds. One now said that they could not decide whether the prints matched, and three others directly contradicted their earlier conclusion, now asserting that these prints did not come from the same source after all.

Mnookin, 7 L. Probability & Risk at 130 (citing Itiel E. Dror, David Charlton & Alisa E. Peron, *Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications*, 156 Forensic Sci. Int. 74 (2006)).

In the recent Supreme Court case *Melendez-Diaz v. Massachusetts*, 129 S. Ct. 2527 (U.S. 2009), the Court held that criminal defendants have a right under the Confrontation Clause to cross-examine any forensic expert whose work the State wishes to offer into evidence. Among the rationales offered in the Court's opinion, which was authored by Justice Scalia, was the significant risk of forensic examiners' bias:

Forensic evidence is not uniquely immune from the risk of manipulation ... A forensic analyst responding to a request from a law enforcement official may feel pressure—or have an incentive—to alter the evidence in a manner favorable to the prosecution.

Id. at 2536 (citing *NAS Report*).

h. The Field of Friction Ridge Analysis Lacks a Training Requirement or Difficult Proficiency Tests.

The field of friction ridge analysis is not centralized. There is no national requirement that friction ridge analysis receive particular kinds or amounts of training to claim the title, and friction ridge analysts can work with both accredited crime laboratories and with nonaccredited facilities like police identification units or private practices. *NAS Report* at 136. The training of latent print examiners varies from agency to agency—some agencies have a formal training process, some do not. *Id.* While there are some training programs available, the content of the programs is not audited. *Id.*

In addition, the field of friction ridge analysis lacks reliable proficiency tests by which an examiner's skill could be assessed:

[P]roficiency tests and procedures have never been assessed for their validity or their reliability. The validity of a proficiency test would be shown by high correlation with other independent measures of skill and ability, such as supervisor ratings, or the quality and quantity of training and experience. The proficiency test manufacturers have never reported any correlations with these independent measures, so nothing is known about the validity of these tests. Further, no information has ever been reported on the reliability of these tests, the degree to which examiners receive the same score when they take a comparable form of the test again. If not reliable, they cannot be valid ....

Further, the prints used in proficiency tests do not reflect normal casework. They are predominately or entirely of value in contrast to casework, in which the majority of latent prints are of no value. These proficiency tests do not include many, if any, exclusions, though, again, the most common outcome in casework is exclusion. When an examiner receives a particular score on such a test, it is impossible to interpret that score other than relative to other examiners who took the same test. The results cannot be generalized to the examiner's performance on the job, or accuracy in court, because the difficulty of the test items is unknown, and the other parameters do not correspond to normal casework.

Lyn Haber & Ralph Norman Haber, *Scientific Validation of Fingerprint Evidence Under Daubert*, 7 L. Probability & Risk 87, 95 (2008) (emphasis added, citations omitted).

B. The Friction Ridge Analysis Offered in This Case Is Unreliable and, Based on the Present Consensus of the Scientific Community, Should Be Excluded from This Trial.

Here, the prosecution wishes to offer expert testimony related to friction ridge analysis for the purpose of absolute identification—to show that a latent print found at the crime scene came from the defendant as a matter of scientific certainty. However, as discussed above, friction ridge analysis is simply not a scientific—or even *reliable*—method for making this kind of conclusive identification.

Furthermore, the examiner in this case did not specify which friction ridge features of the latent print and known print were similar and which features were dissimilar, how much weight he gave each feature, how many features he considered, whether he attributed any dissimilarities to distortion and why he considered them to be distortions rather than evidence that the prints came from different sources, or any other information that would allow a fact-finder to weigh the evidence appropriately. All we have is the examiner's bald assertion that the latent print and known print match, a conclusion that is simply impossible to prove, given the limitations of friction ridge analysis.

1. Friction Ridge Analysis Does Not Satisfy **Daubert.**

The friction ridge analysis offered in this case fails under each prong of the *Daubert* test:

• **Not quantifiable or testable**: The examiner's conclusion is a purely subjective statement that two objects had similar visual characteristics; such a conclusion is totally unquantifiable and so there is no way to determine the reliability of the examiner's analysis. *MIS Report* at 5-6 (2010).

• **Not peer reviewed**: As discussed above, the ACE-V methodology, which was employed in this case, has never been subjected to peer review in a scientific publication. The Verification stage of the analysis is not what is meant as "peer review," and anyway the verification was fatally flawed. The second examiner was biased by knowing that the first examiner concluded that the latent print and known print came from the same source; the second examiner did not truly evaluate the first examiner's results because he relied on different criteria in his analysis; and neither examiner sufficiently documented the steps of their analysis so that it could be adequately compared and assessed.

• **No known rate of error**. As discussed above, the rate of error of the ACE-V methodology has never been scientifically established.

• **No uniform standards**: As described above, friction ridge analysts are not able to define criteria for their comparisons before making an actual comparison, there is no agreement about what features of friction ridge patterns are most probative in making comparisons, and the field has no specific criteria for an analyst to use in deciding whether two fingerprints came from the same source. In addition, the proficiency of the examiner in this case has never been reliably tested, as no reliable proficiency tests exist.

• **Not accepted by the scientific community: The Report of the National Academy of Sciences on friction ridge analysis is equivalent to the scientific community's assessment of this forensic methodology. The NAS's assessment, as described in detail above, found friction ridge analysis as a method of identification to suffer from numerous scientific shortcomings.**

2. Recent Changes in Massachusetts Law Regarding Eyewitness Identification Support Rejection of Fingerprint Evidence

After a thorough review of the science on Eyewitness Identification, the Massachusetts Supreme Judicial Court instructed a radical change to jury instructions in this crucial area. These changes were brought about by an overwhelming scientific criticism of the reliability of what had been a well-established stalwart of criminal prosecution: the eyewitness identification. Defendant argues this radical change authored in eyewitness testimony/evidence supports rejection of fingerprint evidence, despite its having been a long-standing stalwart in criminal prosecution for decades past. .

3. Cross-Examination Will Not Sufficiently Protect the Defendant from Juror Confusion and Cannot Meaningfully Challenge the Examiner's Conclusions.

Few aspects of law enforcement are more thoroughly engrained in the public's consciousness than fingerprints. Through countless movies, television shows, articles, and books members of the general public have been told time and again that a fingerprint "match" can conclusively establish a connection between evidence and n specific individual. No amount of cross-examination by the defense will disabuse them of this notion.

> While we normally leave the humbling of inflated opinions to cross-examination, there is a danger that the mystique of fingerprint identification, which has had a captivating hold on the criminal justice system and society at large for more than one hundred years, is such that cross-examination may not be enough to rectify the effect of a fingerprint expert's use of such terms as "individualized," "absolute," and "match" when testifying, as opposed to presenting the testimony as his or her "opinion" that the latent fingerprints are the defendant's.
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> *Commonwealth v. Gambora*, 933 N.E.2d 50, 66 (Mass. 2010) (Spina, J., concurring).

In addition, because of the ultimately subjective nature of friction ridge analysis, the basis of the examiner's conclusion—his perceptions, as informed by his training and experience—cannot be subjected to meaningful scrutiny through questioning on cross-examination. Recall that the fingerprint examiner's work in this case amounted to visually comparing pairs of fingerprint details and determining (1) whether the pairs were similar or dissimilar and (2) whether dissimilarities support a conclusion that two different fingers made the prints or if instead they were simply distortions resulting from the way the prints were left or collected. In making these decisions, the SWGFAST protocols tell us that the examiner did not follow any specific standards but instead relied on his subjective perceptions, as informed by his training and experience. In other words, he made the crucial decisions about similarity, dissimilarity, and possible distortion by reference to his visual perceptions and how those perceptions stacked up against the hundreds or thousands of fingerprints he analyzed in the past, either in his training or in casework. That information—the perceptions themselves and how those perceptions compared to past comparisons—is the sole basis of the examiner's conclusion, and none of that information is available to the defense.

If the examiner had relied on an identifiable, specific standard, the defense could challenge on cross-examination whether the examiner followed that standard correctly and whether that standard was actually reliable in this case. But since the examiner relied on his own perceptions and experiences in looking at fingerprints—a subject to which the defense has no access—the defense has no way to challenge on cross-examination whether the examiner's decisions appropriately relied on his experiences and whether those experiences are a reliable basis for drawing conclusions about the fingerprints in this case.

C. In the Alternative, this Court Should Limit the Scope of the Expert's Testimony to Exclude Any Conclusions of Absolute Identification Because Such Conclusions Do Not Rest on Reliable Scientific Foundation.

Expert testimony should be limited if there is a significant gap between the existing data and the conclusions drawn by the expert witness during testimony. *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). In *Joiner*, an expert witness testified that a study found that the incidence of lung cancer deaths among workers was somewhat higher than would ordinarily be expected due to their exposure to PCBs, but the trial court excluded his testimony because the studies he relied on did not

support his conclusions, as there was "simply too great an analytical gap between the data and the opinion proffered." *Id.* An expert's testimony must be limited to those conclusions that are supported by the evidence and whatever scientific inquiry has been made into the field at issue.

Here, the friction ridge analyst has issued a report stating that two of the examined fingerprints, latent and known, came from the same source, but that conclusion is simply not valid. Without any idea of what features of the two prints were found to be similar, what features were found to be dissimilar, why dissimilar features did not result in an exclusion, and how common each similar feature is in the human population, it is impossible to say with any accuracy how likely it is that two fingerprints came from the same source.

The only permissible testimony here—the only testimony that would be supported by the evidence—would be a recitation of the specific features that the examiner found to be similar or dissimilar. Given that no reliable scientific study has ever been done to analyze the frequency of these features in fingerprints, the friction ridge analyst has no more idea than the jury does what inferences should be drawn from the similarities or differences, or whether one outweighs the other. The examiner cannot be permitted to testify about any conclusions he may have drawn from the similarities or differences, and he certainly cannot be permitted to testify that the fingerprints "matched." As discussed above, there is no scientific basis for such testimony.

IV. CONCLUSION

Under the applicable evidentiary rules and caselaw, this Court should only allow expert testimony that is reliable. Friction ridge analysis is not a reliable method of absolute identification because of the great disparities in the ways that the comparisons are performed, a lack of standardization of operational principles, and, most importantly, its inability to conclusively demonstrate a connection between the latent print and the known print.

For these reasons and those set forth above, the defendant respectfully requests that this Court exclude the testimony of the friction ridge analyst in this case. In the alternative, the defendant respectfully requests this Court to limit the scope of the examiner's testimony to a recitation of the features of the latent and known prints that the examiner found to be similar and dissimilar.

THE DEFENDANT
By His/Her Attorney
Edward B. Fogarty

Attorney Edward B. Fogarty

CERTIFICATE OF SERVICE: I, Edward Fogarty, certify I have caused a copy of the above to be served upon the Barnstable County District Attorney Office, attn. Sharon Thibeault. /s/ Edward Fogarty

COMMONWEALTH OF MASSACHUSETTS

BARNSTABLE, SS **SUPERIOR COURT**
DOCKET NO. 1572CR00128

COMMONWEALTH
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MOTION TO EXCLUDE EXPERT TESTIMONY ON FRICTION RIDGE ANALYSIS, OR, IN THE ALTERNATIVE, TO CURTAIL SUCH TESTIMONY, UNDER DAUBERT V. MERRELL DOW PHARMACEUTICALS - AFFIDAVIT

1. My name is Edward Fogarty an attorney licensed and in good standing in the Commonwealth. I represent the Defendant named above.

2. I am familiar with discovery regarding fingerprints provided in this case.

3. I am familiar with the 2009 publication, Strengthening Forensic Science in the United States: A Path Forward Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council
4. ("NAS Report")

5. The NAS Report critiqued a number of areas of forensic science. In particular, the NAS Report was critical of the fingerprint "science" e.g. friction ridge analysis.

6. I have reviewed a June 30, 2015, report authored by Sergeant William H. Tarbokas MSP Forensic Services Group.

7. Sgt. Tarbokas has utilized the same techniques and criteria criticized in the NAS Report.

8. The findings and conclusions made by Sgt. Tarbokas as a result are unreliable and should not be permitted to reach the jury.

9. The entire NAS Report is incorporated herein by reference and can be found and downloaded at: https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf

Signed under pains and penalties of perjury this date: May 2, 2019.

THE DEFENDANT
By His/Her Attorney

Edward B. Fogarty

Attorney Edward B. Fogarty

CERTIFICATE OF SERVICE: I, Edward Fogarty, certify I have caused a copy of the above to be served upon the Barnstable County District Attorney Office, attn. Sharon Tinbeault. /s/ Edward Fogarty

EXHIBIT

The Commonwealth of Massachusetts
Department of State Police

CHARLIE D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

DANIEL BENNETT
SECRETARY

COLONEL TIMOTHY P. ALBEN
SUPERINTENDENT

Forensic Services Group
59 Horseshoe Drive
Sudbury, Massachusetts 01776
Telephone (508) 820-2185 Facsimile (508) 820-2191

REPORT OF INVESTIGATIONS

Laboratory Case Number: 15-14854
Agency Case Number: 2015-102-0270
Case Officer: Trooper Gerald P. Donovan #3424, MSP Cape and Islands County Detective Unit
Victim(s): David Colon
Suspect(s): Kyle Walker and Keven Seme

Date: June 30, 2015
Town: Barnstable (Hyannis)
Subject: Fatal Shooting

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Date of Incident: June 19, 2015
Report Number: 4

On June 19, 2015 at approximately 0510 hours, I was contacted by Trooper Bartlett of Crime Scene Services. Trooper Bartlett advised me he was at the scene of a shooting in Hyannis. He further advised me the shooting now appears will be fatal. I arrived at the scene at the intersection of Charles Street and Washington Avenue extension at approximately 0550 hrs.

Upon arrival I met with Trooper Bartlett and Trooper Donovan of the Cape and Islands SPDU. I was advised as to what had happened and the location of known items of interest. The scene consisted of an area along the west side of Washington Ave extension where the victim had been parked when he was shot. Also in the roadway at the intersection with Charles Street was a Dunkin Donuts cup. A silver pistol was also located on the driveway of 25 Charles Street. Trooper Bartlett covered the pistol with a box and evidence bag to prevent the morning dew from damaging any evidence to be recovered from the firearm. Also located, blowing around on the Washington Ave. Ext. was an ATM receipt, which was documented and collected. I was further advised that the suspects had fled the scene via Charles Street cutting through the parking lot of 130 Center Street and going into the house at 10 B Stewart Street.

Trooper Bartlett was the Crime Scene Services case officer was responsible for digital photography and marking items of interest with placards. I then made an appropriate video of the scene. Trooper Cochrane of the Firearms Identification section was also on scene and would collect the firearm and any ballistic evidence. MSP forensic scientist Pratt also responded to the scene to process for biological and trace evidence. Troopers Canavan and Pacheco of the Collision Analysis and Reconstruction section were also called and responded to diagram the scene.

At approximately 0920 hours Trooper Bartlett and I responded to the Cape Mart at 130 Center Street. This area was also documented as it was believed to be the suspect's route of escape from the crime scene. Upon reviewing the suspects on video obtained from the Cape Mart they can be seen touching a metal fence pole to the north east of the cape mart. I then processed the pole for friction ridge impressions, utilizing approved and appropriate methods. Upon analysis, the pole was found to possess friction ridge detail which lacked quality and quantity for identification. Forensic scientist Pratt then processed this area of the pole and the top of a cement wall for potential DNA evidence.

At approximately 1115 hours, I responded to 10B Stewart Street and Assisted Trooper Bartlett and Cape and Islands Detectives Troopers Brightmur and Donovan execute a search warrant on the residence. Also present was forensic scientist Pratt. Items of clothing were collected by FS Pratt (2 pair men's sneakers, 2 sweatshirts, pair of shorts). Trooper Bartlett collected a glassing bag from the inside of a pair of shorts recovered from the bed for further processing.

At approximately 1305 hours I assisted Troopers Brightman and Donovan in the execution of a search warrant on the vehicle in which the victim had been shot. This vehicle was a Nissan Altima bearing Connecticut registration 5APTD3. Trooper Cochrane of FIS and Forensic Scientist Pratt were also present. The vehicle was documented with appropriate digital photographs. Trooper Cochrane the recovered a projectile from the rear passengers' side foot well. FS Pratt processed for biological evidence. I then processed the exterior of the vehicle and the interior of the front windows for latent friction skin impressions utilizing approved and appropriate methodn.
Upon analysis, there were nine areas of friction ridge impression of sufficient quality and quantity for further analysis. Latent impression # 1 was located on the trim around the rear quarter window on the drivers' side. Latent #'s 2, 3 and 4 were located on the driver's door exterior under the window. Latent #'s 5, 6 and 7 were located on the front passenger door exterior under the window. Latent 's 8 and 9 were located on the exterior of the driver's window. These impressions were documented and collected as item 3-3 for further analysis.

At approximately 1710 hours, I took photographs of a Volkswagen owned by Carissa Pryor bearing Massachusetts registration 2WP544 in the rear lot of Barnstable PD.

At approximately 1745 hours, I responded to 793 Route 28 in Yarmouth. Upon arrival, I assisted Cape and Islands SPDU execute a search warrant of room 209 of the Cape Wind Motel. Appropriate digital photos were taken as requested by Trooper Donovan.

All Photos and video were processed and discs were forwarded to appropriate personnel.

On June 25, 2015, I continued work on case 15-14854. I inventoried and documented the contents of container A. Items 6-1 and 6-2 were then processed for latent friction ridge impressions utilizing appropriate and approved methods. These items were then analyzed for friction ridge detail using ACE-V methodology.

6-1 Qty: 1	Firearm .380 caliber COBRA model FS380 semi-automatic pistol serial number FS013408 with one/1/magazine .380 Automatic caliber COBRA FS380 PI Serial Number FS013408
	Upon analysis the above item was found to possess two areas of friction ridge detail of sufficient quality and quantity for identification. These impressions were itemized as 6-1.1 on the top of the fire arm. Item 6-1.2 on the frame of the firearm next to the left side of the trigger.
6-1.1 Qty: 1	Friction Ridge Impression - Photo only: on top of .380 caliber COBRA model FS380 semi-automatic pistol serial number FS013408 with one/1/magazine
	Comparisons conducted utilizing ACE-V methodology resulted in Kyle Walker being excluded as the source of this impression. Further comparisons resulted in latent friction ridge impression 6-1.1 being identified to the right index finger of known Keven Seme. Verifications were then conducted.
6-1.2 Qty: 1	Friction Ridge Impression - Photo only: to left side of trigger of the .380 caliber COBRA model FS380 semi-automatic pistol serial number FS013408 with one/1/magazine
	Comparisons conducted utilizing ACE-V methodology resulted in Kyle Walker being excluded as the source of this impression. Further comparisons resulted in latent friction ridge impression 6-1.2 being identified to the right index finger of known Keven Seme. Verifications were then conducted.
7-2 Qty: 5	Major Case Prints - of Walker, Kyle
7-3 Qty: 5	Major Case Prints - of Seme, Keven

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Sergeant William H. Tarpokas
MSP Forensic Services Group

This report reflects the test results, conclusions, interpretations, and/or the findings of the analyst as indicated by the signature above.